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The grant was used to purchase analysis equipment for the Maryland Revolving Field Monitor (MRFM).

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TECHNICAL REPORT

"Analysis Equipment for MRFM"

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Accomplishments: This grant acquired equipment for to be used to process data collected with the Maryland Revolving Field Monitor (**MRFM**), a unique instrument developed at UMCP to measure the gaze of human subjects accurately as they perform a variety of visually-guided manipulations under natural conditions. This line of research began in 1990 with support from AFOSR, which provided then state-of-the-art equipment (a SUN Sparc2Workstation and an APPLE LaserWriter IINTX Printer) to collect and process data generated by the MRFM. Considerable time during the initial five years was devoted to developing software for collecting and analyzing its data.

The SUN Sparc2Workstation was used to analyze large amounts of data generated by the MRFM that was subsequently described in a number of publications. The proposal for this equipment was submitted once it became clear that SUN Sparc2Workstation could no longer cope with our analysis or mass storage requirements.

All of the hardware requested (a cluster consisting of one server and 4 workstations, as well as a hub, UPSs and a high speed color printer) was ordered, delivered and configured to meet our ever increasing needs for computer support. The new analysis equipment uses an open source OS, VA Linux, and all of the application software that had been developed in our lab for use on the SUN Sparc2Workstation was rewritten, mainly in JAVA, which is designed to be platform-independent. This should make it easier for us to upgrade in the future. All of the application software developed for use with the MRFM is now running at far greater speeds on the VA Linux cluster. We also have increased our mass storage to more than 350 GB. This should be sufficient to take care of our data storage needs at least for the next five years, even after making allowance for the fact that our research is beginning to make many digital video recordings of subjects performing a variety of naturalistic visuomotor tasks. We also used one of our old PCs, running Linux, to install a firewall to keep unwelcome visitors out of our LAN following an unauthorized break-in that interfered significantly with our ongoing work.

Taking full advantage of all of our new equipment requires development of a considerable amount of new software to make it possible to visualize our subjects' gaze-control as experiments are running and while data are being collected. This software will allow us to vary experimental parameters as experiments proceed. This elaboration of our present capacity should allow relatively rapid progress with our experimental protocols. In fact, it is likely that the ability to monitor gaze-control as an experiment in actually underway will make it possible to open up new lines of research. This capacity will encourage us to run pilots on a number of relatively low probability experimental conditions because we will be able to see what is actually happening as we go along collecting eye and head movement data. We are working in a novel, and relatively little explored experimental domain, so this capacity could prove to be very helpful.